Standish Quadrangle, Maine

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Funding for the preparation of this map was provided in part by the U.S. Geological Survey
Cooperative Geological Mapping (COGEOMAP) Program, Cooperative Agreement No. 14-08-0001-A0793.

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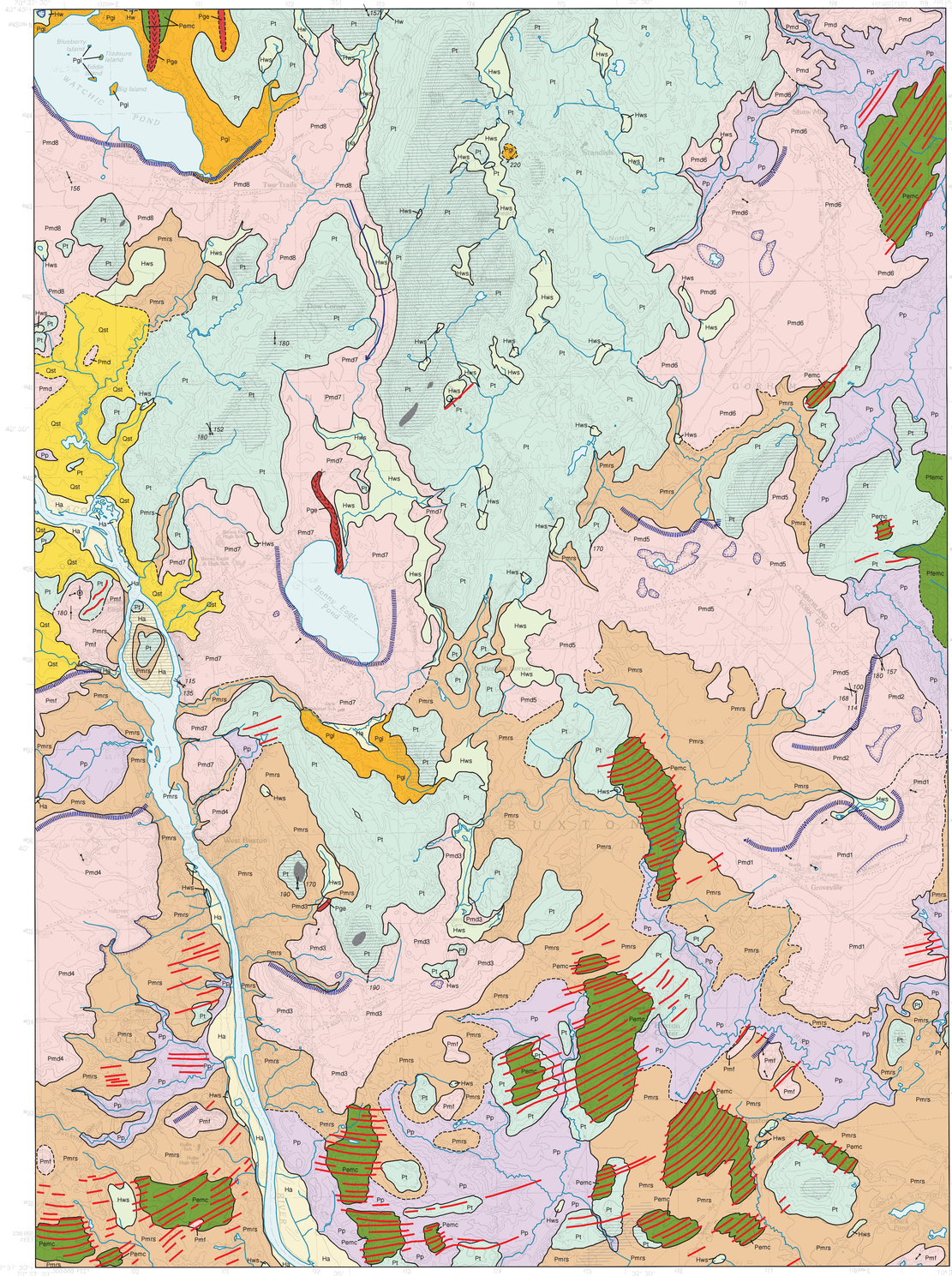
Open-File No. 99-101
1999

For additional information,
see Open-File Report 99-132.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping by John C. Gosse completed during the 1990 field season; funding for this work provided by the U. S. Geological Survey COGEOMAP program. Geologic unit designations and contacts revised and matched to adjacent quadrangles in 1999 by MGS geologists.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Standish quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Ha **Alluvium** - Generally well-sorted and stratified silt, sand, and gravel on flood plains of modern rivers and streams.

Hw **Freshwater wetlands** - Muck, peat, silt, and sand. Poorly drained areas, often with standing water.

Hws **Wetland, swamp** - Peat, muck, silt, and clay in poorly drained and wetland areas with variable tree cover. Includes marshes and heaths.

Qst **Stream terrace** - Generally flat surface planed by postglacial fluvial activity or underlain by alluvium. Surface is above modern flood plain. Associated with postglacial river and stream deposits.

Pmrs **Marine regressive sand deposits** - Well-sorted massive to finely laminated silt to coarse sand. Associated with Pp, Pmd, and Pmf, which it commonly overlies. Locally includes shoreline and nearshore deposits.

Pp **Presumpscot Formation** - Greenish-gray to bluish-gray marine silt and clay. May be laminated or massive. Occurs as variably thick veneer overlying older units below the marine limit.

Pmd **Marine delta** - Generally thick deposits of sorted and interbedded sand and gravel with well-developed deltaic foreset beds. Topset beds are known or inferred to be present. Grades seaward to Pmrs or Pp. Locally includes shoreline and nearshore sand and gravel deposits where delta was eroded by the sea. If present, a subscript number refers to sequence of deposition (Table 2 of Gosse, 1999).

Pmf **Marine fan** - Generally thick deposits of sorted and interbedded sand and gravel. Foreset beds commonly well-developed. No topset beds. Grades seaward to Pmrs or Pp. Closely associated with Pemc.

Pge **Esker** - Sinuous, generally discontinuous ridges of massive and stratified, commonly interbedded, sand and gravel which was released from subglacial and englacial meltwater conduits during glacial retreat. Cobble to boulder-size clasts are commonly highly rounded and spherical. Associated with Pmd.

Pgi **Ice-contact deposits** - Massive to stratified seaward-graded sand and gravel deposited near the ice margin by glacial meltwater. May include outwash. Topography locally kettled or hummocky. Evidence of deformation (faults and folds) often present.

Pfemc **Fan-end moraine complex** - Composite unit incorporating elements of end moraines and subaqueous fans. Coarse to fine sand and gravel extending from fan head to fan toe. This material overlies sediments of end moraine and end moraine complex.

Pemc **End moraine complex** - Cluster of closely (and often evenly) spaced ridges comprised of till or poorly sorted sand and gravel, deposited at the glacier margin. Can include small patches of Pmf and thin veneers of Pp or Pmrs.

Pt **Till** - Homogeneous, locally compact, poorly sorted mixture of a wide range of particle sizes from silt to boulders. Unit is widespread with very variable thickness (typically 0 - 5 m). Associated with bedrock highs.

Bedrock - Bedrock of Paleozoic age. "rk" indicates areas of barren ledge. The ruled pattern indicates areas where surficial sediments are generally less than 2 m thick.

Contact - Boundary between map units. Dashed where boundary is uncertain or inferred.

Ice margin position - Inferred position of the glacier margin during deposition of the adjacent marine delta or fan. The line is drawn along the backslope of deltas.

Scarp - Wave-cut scarp eroded at front of delta during regression of sea.

Moraine ridge - Ridges of till and/or water-laid sediments deposited in the marginal zone of the glacier. Lines indicate ridge crests.

Esker ridge - Shows trend of sand and gravel ridge deposited in meltwater tunnel beneath the ice sheet (Pge). Chevrons indicate the direction of inferred meltwater flow.

Glacial striation locality - Dot indicates point of observation. Arrow indicates direction of ice flow, if known. Flagged arrows indicate earlier flows (see Table 3 of Gosse, 1999).

Till fabric locality - Combined orientation of the long axis of at least 30 pebbles in till (see Figure 3 of Gosse, 1999). Dot indicates fabric site. Arrow indicates direction of inferred ice flow.

Fold axis - Measurement of the trend of a fold axis in deformed ice-contact sediment. Intersection of the bar and arrow indicates the location of the observation. Arrow indicates the inferred ice flow direction (see Table 3 of Gosse, 1999).

Paleoflow direction - Arrow indicates the flow direction of a paleocurrent which deposited glaciofluvial or glaciomarine sediments. Tail of arrow indicates location of observation (see Table 4 of Gosse, 1999).

Glacially streamlined hill - Indicates a hill that has been elongated parallel to the direction of ice flow. The hill may be bedrock-cored.

Kettle - Depression created by melting of a buried mass of glacial ice and collapsing of the overlying sediment. May contain a small pond or wetland.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Gosse, J. C., 1999, Surficial geology of the Standish 7.5-minute quadrangle, York and Cumberland Counties, Maine: Maine Geological Survey, Open-File Report 99-132, 24 p.
2. Gosse, J. C., 1998, Surficial materials of the Standish quadrangle, Maine: Maine Geological Survey, Open-File Map 98-176.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Standish quadrangle, Maine: Maine Geological Survey, Open-File Map 98-142.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.